ABSTRACT OF THE DISCLOSURE

Gas containing fuel vapor is purged as purge gas from a canister to an intake passage of an engine through a purge line. An ECU renews a vapor concentration value representing the concentration of fuel vapor contained in the purge gas by a predetermined renew amount at a time in response to a deviation of a detected air-fuel ratio relative to a target air-fuel ratio. The ECU sets the amount of fuel supplied to the combustion chamber of the engine according to the renewed vapor concentration value such that the detected air-fuel ratio seeks the target air-fuel ratio. The ECU computes the ratio of air flowing through the intake passage to a predetermined maximum air flow rate, and sets the computed ratio as an engine load ratio. The ECU sets a smaller value of the renew amount for a greater value of the engine load ratio. As a result, the learning of the vapor concentration is reliably performed, and the accuracy of the air-fuel ratio control is improved.